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## New Species and New Combinations of *Justicia* (Acanthaceae) from the Venezuelan Guayana

Dieter C. Wasshausen

Department of Botany, National Museum of Natural History, Smithsonian Institution,  
Washington, D.C. 20560, U.S.A.

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**ABSTRACT.** Recent expeditions in the Venezuelan Guayana have resulted in additional new taxa in *Justicia* (Acanthaceae). The following places these novelties and new combinations on record for the convenience of other taxonomists prior to the publication of the *Flora of the Venezuelan Guayana*. Nine new Venezuelan species of *Justicia*, *J. breteri*, *J. delascioi*, *J. huberi*, *J. monachinoi*, *J. nuriana*, *J. panarensis*, *J. parimensis*, *J. parwana*, and *J. uvida*, are described, illustrated, and compared with their closest relatives. In addition, two new combinations, *J. paraguayensis* and *J. moritziana*, are also necessary. A key to all of the known species of *Justicia* from the region (Territorio Federal Delta Amacuro, Estado Bolívar, and Territorio Federal Amazonas) is also provided.

*Justicia* is the largest and taxonomically the most complex genus of Acanthaceae, with between 420 (Mabberley, 1987) and 600 or so (Graham, 1988) species worldwide. The genus, named for eighteenth-century Scottish horticulturist and botanist James Justice, is distributed throughout the tropics and subtropics of both hemispheres, even into the temperate regions of North America, with one species extending as far north as Quebec, Canada. The taxonomic history of the genus is rather complex, and recently Graham (1988) attempted an overall schematic delimitation of the taxa in this assemblage of dissimilar elements. By utilizing characters of inflorescence, androecium, pollen, and seeds, she proposed the broadest definition of *Justicia* yet to date. Earlier, Nees (1847), in his major monograph of the family, divided the group into a number of smaller genera such as *Adhatoda*, *Amphiscopia*, *Beloperone*, *Leptostachya*, *Rhytiglossa*, and *Sericographis* in the New World. At that time he knew nothing about the markedly different types of pollen within the family that Radlkofer (1883) and Lindau (1895) later emphasized and used extensively in their taxonomic delimitation. Bremekamp (1948), after diligently studying the pollen types in the group, recognized most of the genera proposed by Nees. In addition, he described a number of new genera

for the New World such as *Calliaspidia*, *Dyspemptemorion*, and *Psacadocalymma*. Currently the authors of most recent floras reject the delimitations proposed by Nees and Bremekamp. They seem to concur with Stearn (1971) that until correlations between character of inflorescence, floral characters, and pollen types have been analyzed for a large number of species throughout their ranges, and relatively homogeneous natural groups have been defined, the simplest course is to maintain *Justicia* as a large genus while recognizing the possibility of its later dismemberment and the revival of names now buried in its synonymy.

The genus is characterized by the 2 or 3 aperturate pollen with a trema area usually traversed by 2–8 rows of up to 10 insulae. This form of pollen was called “Knötchenpollen” by Lindau (1893). The plants are shrubs or herbs with the flowers variously disposed. In the region here covered, however, two basic inflorescence types are prominent: one consists either of a simple spike (sometimes terminal and axillary forming a cluster of spikes) with 2 flowers per node (or rarely a simple spike reduced to 1 or 2 sessile axillary flowers); the other is compound, composed of spicate units, which are usually secund and arranged along a main axis forming a rather large panicle. The floral bracts and bracteoles are of various shapes and sizes, imbricate or distant, and the calyx is 5-parted with the segments usually narrow and nearly equal. The corollas are gamapetalous and zygomorphic, with the tube divided above into 2 lips, the upper shallowly bilobed and the lower distinctly trilobed. There are two stamens and no staminodes; the anthers are variously 2-lobed with the thecae superposed or 1-lobed. The oblique connective varies in length and the lower thecae is usually spurred, apiculate, or mucicous, occasionally much reduced. The fruit in *Justicia* is a 2-valved loculicidal capsule with usually 4 but occasionally 2 seeds. The lower portion of the capsule is commonly sterile and solid (capsule clavate), but in the Venezuelan Guayana we find a species in which the capsule is completely ovoid, without a solid basal stipitate portion.



In the Venezuelan Guayana, most taxa of *Justicia* are limited to gallery forests and woodlands along banks of rivulets and swale margins at elevations between 100 and 1,400 m. Like many Acanthaceae, they are of local distribution in undisturbed forests and are rarely collected in secondary growth. This pronounced endemism explains why so many of the new taxa are only known from single collections. In an attempt to identify the recent collections of *Justicia* from the Venezuelan Guayana, I have found nine undescribed species of the genus.

KEY TO THE VENEZUELAN GUAYANA SPECIES OF *JUSTICIA*

- 1a. Capsule ovoid, without a solid basal stipitate portion, abruptly beaked at apex ..... 3. *J. nuriana*
- 1b. Capsule claviform (unknown for *J. huberi*, *J. delascioi*, and *J. panarensis*, but probably claviform), with solid basal stipitate portion, acute to obtuse or bifid at apex.
  - 2a. Inflorescence diffuse, with numerous branches; bracts and bracteoles small, less than 2 mm long and 1 mm wide; low-growing herbs or undershrub; corollas usually less than 15 mm long.
    - 3a. Corolla 4.5–6 mm long; inflorescence axillary and terminal, with branches 3–7 in whorl ..... *J. comata*
  - 3b. Corolla 7–15 mm long; inflorescence mostly terminal, simple or with alternate branches.
    - 4a. Flowers borne in spikes to 5 cm long; capsules ovate-stipate, 17 mm long; seeds suborbicular, 5 mm long, 5.5 mm wide, gray or flecked brown ..... *J. laevilinguis*
    - 4b. Flowers borne in rather loose panicles 5–17 cm long; capsules clavate, 7.5–8 mm long; seeds suborbicular, 1.5 mm diam., light or reddish brown.
      - 5a. Leaf blades ovate, decurrent on the petiole from a rounded base; panicles ca. 17 cm long and 15 cm broad; corollas yellow with faint rose on the lower lip, 9–10 mm long ..... 4. *J. monachinoi*
      - 5b. Leaf blades narrowly to broadly lanceolate, acute to obtuse at base, not decurrent on the petiole; panicles 5–16 cm long and to 6 cm broad; corollas white, lilac, or purple, to 8 mm long ..... *J. pectoralis*
- 2b. Inflorescence dense, stout (or if somewhat lax, as in *J. parimensis*, then with corollas ca. 45 mm long); bracts and bracteoles conspicuous, more than 2 mm long and 1 mm wide; herbs, weak shrubs, or subshrubs; corollas usually more than 15 mm long (except in *J. cataractae*, *J. polystachya*, and *J. moritziana*, where corollas can be 10–13 mm long).
  - 6a. Inflorescence a simple spike (sometimes terminal and axillary forming a cluster of spikes) with 2 flowers per node, a 2–3-flowered cyme, or reduced to 1 or 2 sessile axillary flowers.
    - 7a. Inflorescence a congested terminal capitulum, sessile, subtended by 4 ovate leaf blades ..... 1. *J. paraguayensis*
    - 7b. Inflorescence short spikes, cymes or clusters of spikes or thyrses, these pedunculate, not subtended by 4 leaf blades.
      - 8a. Corollas white to pale purple, about 10 mm long.
        - 9a. Bracts subulate, very narrow, 0.25 mm wide ..... *J. cataractae*
        - 9b. Bracts oblanceolate or ovate, 3–7.5 mm wide.
          - 10a. Bracts ovate, imbricate, 6.5–7.5 mm wide; spikes dense, 2–7 cm long, 1.5 cm wide ..... *J. polystachya*
          - 10b. Bracts oblanceolate, not imbricate, 3 mm wide; spikes lax, 1–1.5 cm long, 0.5 cm wide ..... 2. *J. moritziana*
      - 8b. Corollas red, purple, rose-lavender, glossy orange, never completely white, 15–60 mm long.
        - 11a. Bracts and bracteoles conspicuously deep red or wine-colored.
          - 12a. Flowers borne in dense, terminal spikes 3 cm long, these surrounded and partially hidden by the upper leaf blades; the blades imbricated, elliptic-oblong, 2.7–3.2 cm long and 1.4–1.6 cm wide, subcoriaceous; corollas 40–45 mm long ..... 5. *J. huberi*
          - 12b. Flowers borne in axillary and terminal spikes 3.5–5 cm long, these (at least the terminal spikes) exceeding the upper leaf blades; the blades not imbricated, oblong to lanceolate, 6.5–8 cm long and 1.8–2.3 cm wide, firmly membranous; corolla 35–40 mm long ..... 7. *J. parwana*
        - 11b. Bracts and bracteoles not conspicuously colored.
          - 13a. Corollas 15–16 mm long.
            - 14a. Leaf blades oblong, 11.5–16 cm long, narrowed at the base and decurrent on the petiole, subchartaceous; bracts and bracteoles 6–7 mm long, 0.5 mm wide; calyx segments 9–10 mm long, 1 mm wide ..... *J. hylaea*
            - 14b. Leaf blades lanceolate to ovate, 5–8 cm long, obtuse or rounded at base, not decurrent on the petiole, membranous; bracts and bracteoles 5.5–6 mm long, 0.8–1 mm wide; calyx segments 6.2–8 mm long, 1.4–1.75 mm wide.



- 15a. Spikes moderately dense, the peduncles 1.8–8.8 cm long, corolla purple or red, the tube 4 mm wide, the upper lip cucullate, the lobes of the lower lip 1 mm long ..... *J. guianensis*
- 15b. Spikes dense, the peduncles 10–13.5 cm long; corolla rose-lavender, the tube 3 mm wide, the upper lip flat, the lobes of the lower lip 2 mm long ..... 8. *J. uvida*
- 13b. Corollas 25–60 mm long.
  - 16a. Bracts conspicuous, ovate, oblong or oblanceolate, 2.25–10 mm wide.
    - 17a. Flowers (2–3) borne in short, axillary and terminal cymes 1.5–2 cm long ..... 9. *J. delascioi*
    - 17b. Flowers borne on one to several axillary and terminal compact spikes 2–7 cm long.
      - 18a. Spikes short, 2–2.5 cm long; bract oblong, 2.25–3 mm wide; corolla glossy orange, yellow at base, about 50 mm long ..... 10. *J. breteleri*
      - 18b. Spikes 2–7 cm long; bracts ovate or oblanceolate, 3–10 mm wide; corolla red, reddish purple, or violet.
        - 19a. Corolla red, 40 mm long, the upper lip oblong to narrowly ovate, 18 mm long, the tube narrowly infundibuliform, about 28 mm long, 3 mm wide at base ..... 6. *J. panarensis*
        - 19b. Corolla reddish purple or violet, the upper lip triangular ovate, about 10 mm long, the tube infundibuliform, about 10 mm long, 4 mm wide at base ..... *J. carthaginensis*
  - 16b. Bracts inconspicuous, not readily distinguished from the bracteoles and calyx segments, linear lanceolate, 0.5–1.5 mm wide.
    - 20a. Calyx segments green, 10.5–12.5 mm long, 1.75 mm wide, the cystoliths conspicuous under a lens; corolla glabrous; bracts and bracteoles puberulent, the trichomes whitish ..... *J. schomburgkiana*
    - 20b. Calyx segments colored, 5 mm long, 0.75 mm wide, the cystoliths lacking or inconspicuous under a lens; corolla pubescent; bracts and bracteoles pilose, the trichomes brown ..... *J. kunhardtii*
- 6b. Inflorescence compound, composed of spicate units that are usually secund and arranged along one main axis.
  - 21a. Spikes fascicled, forming in aggregate a loose terminal panicle ..... 11. *J. parimensis*
  - 21b. Spikes not fascicled, inflorescence composed of spikelike racemes, the latter forming a rather large terminal panicle.
    - 22a. Upper leaf blades conspicuously large, 24–30 cm long and 8–12 cm wide; panicles somewhat lax; bracts subulate, 2.5 mm long; corolla rich purple-pink .. *J. wurdackii*
    - 22b. Upper leaf blades smaller, to 15 cm long and 4.5–6 cm wide; panicles rather dense; bracts triangular, 1.5 mm long; corolla dull crimson to brick red.
      - 23a. Corolla 50–60 mm long, slightly curved, glabrous; calyx segments linear and tapering into a long point, 1 mm wide, glabrous or minutely puberulous, the trichomes, when present, glandular ..... *J. calycina*
      - 23b. Corolla about 30 mm long, erect, sparingly puberulous; calyx segments oblong-lanceolate, 1.25 mm wide, hirtellous with a mixture of glandular and eglandular trichomes ..... *J. secunda*

**1. *Justicia* (sect. *Simonisia*) *paraguazensis*** Wasshausen, nom. nov. Replaced name: *Chaetochlamys wurdackii* Leonard in Mem. New York Bot. Gard. 10(4): 47. 1961, non *J. wurdackii* Leonard. 1961. TYPE: Venezuela. Bolívar: Wurdack & Monachino 40985 (holotype, US).

**2. *Justicia moritziana*** Wasshausen, nom. nov. Replaced name: *Amphiscopia lancifolia* Tafalla ex Nees var. *minor* Nees in DC. Prodr. 11: 357. 1847, non *J. minor* T. Anders. 1864. TYPE: Venezuela. Caracas: Moritz s.n. (holotype, B destroyed).

**3. *Justicia nuriana*** Wasshausen, sp. nov. TYPE: Venezuela. Bolívar: Altiplanicie de Nuria, E of Cerro El Picacho, N of Las Nieves and Las Chicharras, 45 km N of Tumeremo, vicinity of Deborah, 600–650 m, 5–8 Feb. 1961, *Steyermark 89126* (holotype, US; isotypes, NY, VEN). Figure 1A–D.

Herba, caulibus quadrangularibus, glabris vel sursum puberulis. Foliorum lamina late oblonga vel ovata, acuminata, basi obtusa, membranacea, utrinque glabra vel subtus in costa et venis lateralibus parce puberula; petioli glabri vel parce puberuli; spicae graciles, terminales, pe-





Figure 1. A–D. *Justicia nuriana* Wasshausen (Steyermark 89126). —A. Habit. —B. Bracteoles and calyx segments. —C. Calyx segments, cupule, and glands. —D. Bracteoles, calyx segments, and capsule. E–G. *Justicia monachinoi* Wasshausen (Wurdack & Monachino 39978). —E. Habit. —F. Calyx, ovary, and pistil. —G. Bracts, bracteoles, calyx segments, corolla, and stamens.



dunculis subquadrangularibus, bifariam puberulis, rachidibus puberulis; bracteae et bracteolae triangulares, minute puberulae et ciliatae; calycis segmenta viridia, lanceolata, minute puberula et ciliata; corolla non visa; capsulae ovoidae, apice abrupte rostratae, aliquantum compressae, atropurpureae et nitidae, parce puberulae.

Herb to 1 m tall; stem erect, subquadrangular, glabrous below, becoming puberulous above, the trichomes retrorsely curved, subappressed, arranged  $\pm$  in two rows. Leaves on petioles 2.5–6 cm long, these glabrous or sparingly and inconspicuously puberulous, the blades broadly oblong to ovate, 16.5–21.5 cm long, 5.5–10.5 cm wide, acuminate, obtuse at base, membranous, entire, dark green and glabrous above, dull paler green and glabrous below, the costa and lateral veins (7–9 pairs) inconspicuous above, raised and prominent beneath, sparingly puberulous, the cystoliths conspicuous under a lens and scattered on the upper surface, less conspicuous beneath. Flowers borne in slender spikes terminating the branches, 9–12 cm long, 1.5 cm broad, rather loose, the internodes 10–20 mm long, the peduncles 10–15 cm long, subquadrangular, bifariously puberulous, the trichomes retrorsely curved, subappressed, the rachis puberulous, the trichomes retrorsely curved; bracts triangular, 2 mm long, 1 mm wide, minutely puberulous and ciliolate; bracteoles triangular, 1.5 mm long, 0.7 mm wide near the base, puberulous and ciliolate; calyx green, deeply 5-segmented, the segments lanceolate, 6 mm long, 0.75 mm wide, minutely puberulous and ciliolate, distinctly 3-nerved; corolla wanting. Capsule ovoid, 13 mm long, 8 mm broad, 2–3 mm thick, abruptly beaked at apex, somewhat compressed, deep purplish and nitid when ripe, sparingly puberulous.

*Distribution.* Steep moist forested slopes over boulders, cloud forest just below the summit, Estado Bolívar, Venezuela, between 600 and 650 m. Known only from the type collection.

*Justicia nuriana* does not appear to be closely related to any of the known species of *Justicia* from the Guianas, Venezuela, or Colombia. Unfortunately, the new species is known only from fruiting material. However, since the ovoid capsule of this taxon is so distinctive, I feel that it is important at the present time to bring these unusual collections into the Acanthaceae literature.

#### 4. *Justicia monachinoi* Wasshausen, sp. nov.

TYPE: Venezuela. Estado Bolívar: Piedra Marimare, E bank of Río Orinoco opposite head of Isla El Gallo, 200 m, 19 Dec. 1955, *Wurdack & Monachino* 39978 (holotype, US; isotype, NY). Figure 1E–G.

Suffrutex, caulibus quadrangularibus, glabris vel parce puberulis. Foliorum lamina ovata, acuminate, basi rotundata et in petiolum decurrens, membranacea, utrinque glabra vel subtus in costa et venis lateralibus parce puberula; paniculae terminales et axillares, aliquanto laxae, pedunculis et pedicellis puberulis; bracteae et bracteolae subulatae, puberulae; calycis segmenta linearia-lanceolata, puberula, ciliolata; corolla flava cum rosea diluta in labio inferiore, minute pubescens, labio superiore erecto, triangulato-ovato, minute bilobato, labio inferiore trilobato, lobis ovatis, rotundatis; stamina exserta; lobi antherarum superpositi.

Undershrub to 1.5 m high; stems somewhat branched, subquadrangular, glabrous or sparingly puberulous, the trichomes retrorsely curved, subappressed, occasionally gland-tipped. Leaves on petioles 1–2.5 cm long, these sparingly puberulous with appressed-ascending trichomes, the blades ovate, 6–11 cm long, 3–5.5 cm wide, acuminate, decurrent on the petiole from a rounded base, membranous, entire or undulate, yellowish green, both the upper and lower surface glabrous or sparingly and inconspicuously puberulous, the costa and lateral veins (5 or 6 pairs) bearing a few appressed-ascending trichomes, prominent and conspicuous on the lower surface, less so above, the cystoliths minute, scattered. Panicles terminal and axillary, forming a large complex inflorescence 17 cm long and 15 cm broad, the ultimate bracts subulate, 1 mm long and 0.4 mm wide, puberulous, the trichomes  $\pm$  spreading; bracteoles subulate, 0.8 mm long and 0.25 mm wide, puberulous, the trichomes  $\pm$  spreading; rachis and rachilla puberulous, the trichomes erect, occasionally gland-tipped; pedicels 0.5–1 mm long, puberulous; calyx deeply 5-segmented, the segments linear-lanceolate, 2.8–3 mm long, 0.5 mm wide near the base, puberulous and gland-dotted, the trichomes erect, ciliolate; corolla yellow with faint rose on the lower lip, 9–10 mm long, minutely pubescent, the tube about 1 mm broad at base, 4 mm broad at mouth, the upper lip erect, triangular-ovate, 3.5 mm wide at base, gradually narrowed to tip, this bilobed, the lobes about 0.2 mm long and wide, acute, the lower lip  $\pm$  spreading, cuneate, 5 mm wide at base of lobes, these ovate, about 1.5 mm long and 1.5 mm wide, rounded at tip; stamens exserted about 2 mm beyond the mouth of the corolla tube, the anthers 2.5 mm long, the lobes superposed, vertically attached to a connective which itself is 1 mm long, glabrous, the lower thecae calcarate, the spur about 0.4 mm long, blunt; pollen grains 2-porate, bilateral,  $44 \times 22 \mu\text{m}$ , the pores circular, trema area microreticulate, traversed by 2 rows of 5 peninsulae (Fig. 3A). Capsule clavate, 7.5 mm long, 2.5 mm wide, 1.5 mm thick, puber-



ulous; seeds suborbicular, about 1.5 mm diam., 0.5 mm thick, light brown, tuberculate.

*Distribution.* According to label data locally frequent, Estado Bolívar, Venezuela, at 200 m elevation. Known only from the type locality.

*Justicia monachinoides* is perhaps most closely related to the widespread lowland species of *J. pectoralis* Jacq., which differs markedly by having a rather diffuse inflorescence with numerous very slender branches 5–16 cm long and to 6 cm broad, the corollas being white, lilac, or purple, to 8 mm long, with the throat transversely plicate, sometimes spotted with dark purple and the plants being weak stemmed herbs. In contrast, *J. monachinoides* has axillary and terminal panicles forming a large complex inflorescence 17 cm long and 15 cm broad, the corollas yellow with faint rose on the lower lip, 9–10 mm long and the plants being undershrubs with branched stems.

**5. *Justicia huberi* Wasshausen, sp. nov. TYPE:** Venezuela. Bolívar: Dist. Cedeño, Sierra de Maigualida, NE sector, high plateau tepuyana located on the headwaters of the Río Chajura, western affluent of the Río Erebató, 5°33'N, 65°13'W, 2,100 m, 28 Mar. 1988, *Huber 12731* (holotype, NY). Figure 2A–D.

Suffrutex, caulibus subquadrangularibus, glabris vel puberulis. Foliorum lamina imbricata, elliptico-oblonga, acuta, basi angustata, subcoriacea, supra glabra vel puberula, minute punctata, subtus in costa et venis lateralibus parce puberula; petioli breves; spicae terminales, densiflorae, deminutae foliorum laminae subtentae, pedunculis subquadrangularibus, dense puberulis; bractae vinaceae, ellipticae, glabrae vel parce puberulae et ciliatae; bracteolae vinaceae, oblongae; calycis segmenta lanceolata, glabra vel parce puberula, ciliolata; corolla atrorosea, glabra, tubo anguste infundibuliformi, labio superiore erecto, oblongo vel anguste ovato, bilobato, labio inferiore trilobato, lobis oblongis, rotundatis; stamina exserta; lobi antherarum superpositi.

Shrub 0.5–1.5 m tall; stem erect, subquadrangular, glabrous or puberulous, the trichomes retrorsely curved, subappressed, sordid. Leaves on petioles 2–3 mm long, these puberulous with sordid, appressed-ascending trichomes, the blades imbricated, elliptic-oblong, 2.7–3.2 cm long, 1.4–1.6 cm wide, acute, narrowed at base, subcoriaceous, entire, the margins revolute, the upper surface lustrous, glabrous or bearing a few appressed trichomes, especially along the costa, minutely punctate, the lower surface sparingly puberulous especially along the costa and lateral veins (5–6 pairs), these obscure above and prominent and raised beneath, the trichomes adpressed-ascending, 0.2 mm long. Flowers

borne in dense, terminal spikes 3 cm long and 1–1.5 cm broad, obtuse or rounded at tip, each flower cluster subtended by reduced leaf blades, the peduncles 10–12 mm long, subquadrangular, densely puberulous with sordid, appressed-ascending trichomes; bracts wine-colored, elliptic, 15–16 mm long, 8–9 mm wide, obtuse, narrowed at base, firm, nitid, glabrous or sparingly puberulous, the margins revolute, sparingly ciliate; bracteoles wine-colored, oblong, 10 mm long, 1.5–2 mm wide, glabrous or sparingly and minutely puberulous, the margins ciliolate, the costa and lateral veins prominent; calyx deeply 5-segmented, the segments lanceolate, 7 mm long, 1 mm wide, nitid, glabrous or minutely and inconspicuously puberulous, ciliolate; corolla deep rose-colored, 40–45 mm long, glabrous, the tube 3 mm broad at base, narrowed to 2.5 mm at 3 mm above base, thence gradually enlarged to 7.5 mm at mouth, the lips subequal, 22 mm long, the upper lip oblong to narrowly ovate, 11 mm wide near the base, 4 mm wide near the tip, bilobed, the lobes 0.5 mm long, rounded, the lower lip  $\pm$  spreading, 3-lobed, the lobes oblong, 6 mm long, the lateral lobes 3.5 mm wide, the middle lobe 4 mm wide, all rounded at tip, delicately veined; stamens almost reaching the tip of the upper lip, the filaments flattened, glabrous, the anthers 4 mm long, the thecae 2.5 mm long, superposed, somewhat obliquely attached to the connective which itself is about 0.5 mm wide, both thecae terminating at base in a short blunt spur 0.25 mm long; pollen 3-porate, prolate to perprolate,  $49 \times 25 \mu\text{m}$ , the pores circular, the membrane reticulate, trema area studded with 2 rows of 5,  $\pm$  circular insulae (Fig. 3B, C); ovary glabrous; style 3.5 cm long, glabrous; stigma minute, bilobed. Capsule wanting.

*Distribution.* Frequent in grassland, Estado Bolívar, Venezuela, at 2,100 m. Known only from the type locality.

*Justicia huberi* is closely affiliated with another Venezuelan species, *J. parwana* Wasshausen from Territorio Federal Amazonas, Cerro Sipapo, and Serranía Parú. In *J. parwana* the flowers are borne in axillary and terminal spikes 3.5–5 cm long, they are not subtended by the reduced leaf blades, the leaf blades are oblong to lanceolate, 6.5–8 cm long and 1.8–2.3 cm wide, firm and net-veined and the corollas are rose-colored, 35–45 mm long, and puberulous. In contrast, the flowers of *J. huberi* are borne in dense, terminal spikes 3 cm long, and each floral cluster is subtended by reduced leaf blades, the leaf blades are elliptic-oblong, 2.7–3.2 cm long and 1.4–1.6 cm wide, subcoriaceous, not net-veined,



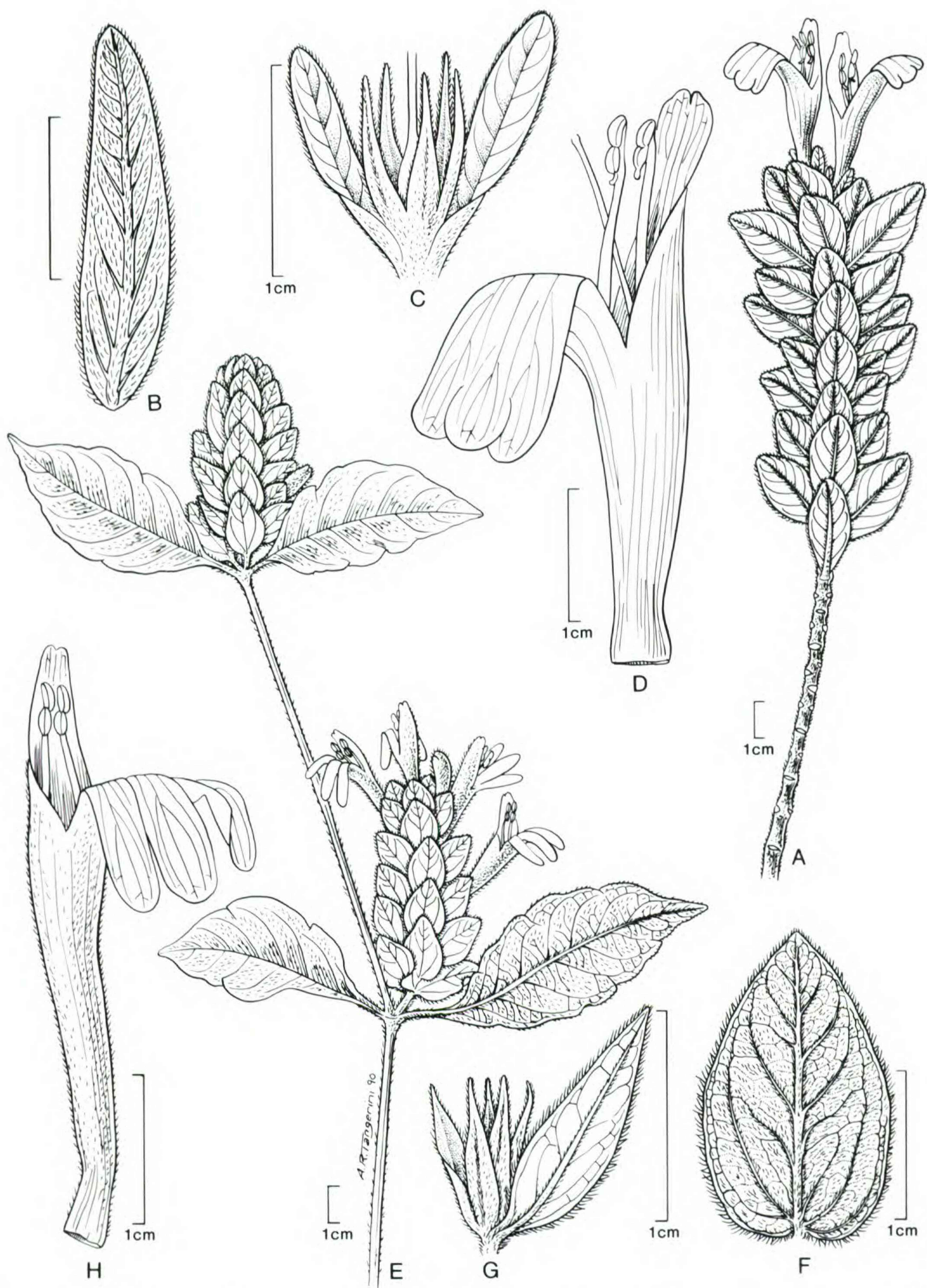


Figure 2. A–D. *Justicia huberi* Wasshausen (Huber 12731). —A. Habit. —B. Bract. —C. Bracteoles and calyx segments. —D. Corolla and stamens. E–H. *Justicia panarensis* Wasshausen (Boom & Grillo 6315). —E. Habit. —F. Bract. —G. Bracteoles and calyx segments. —H. Corolla and stamens.



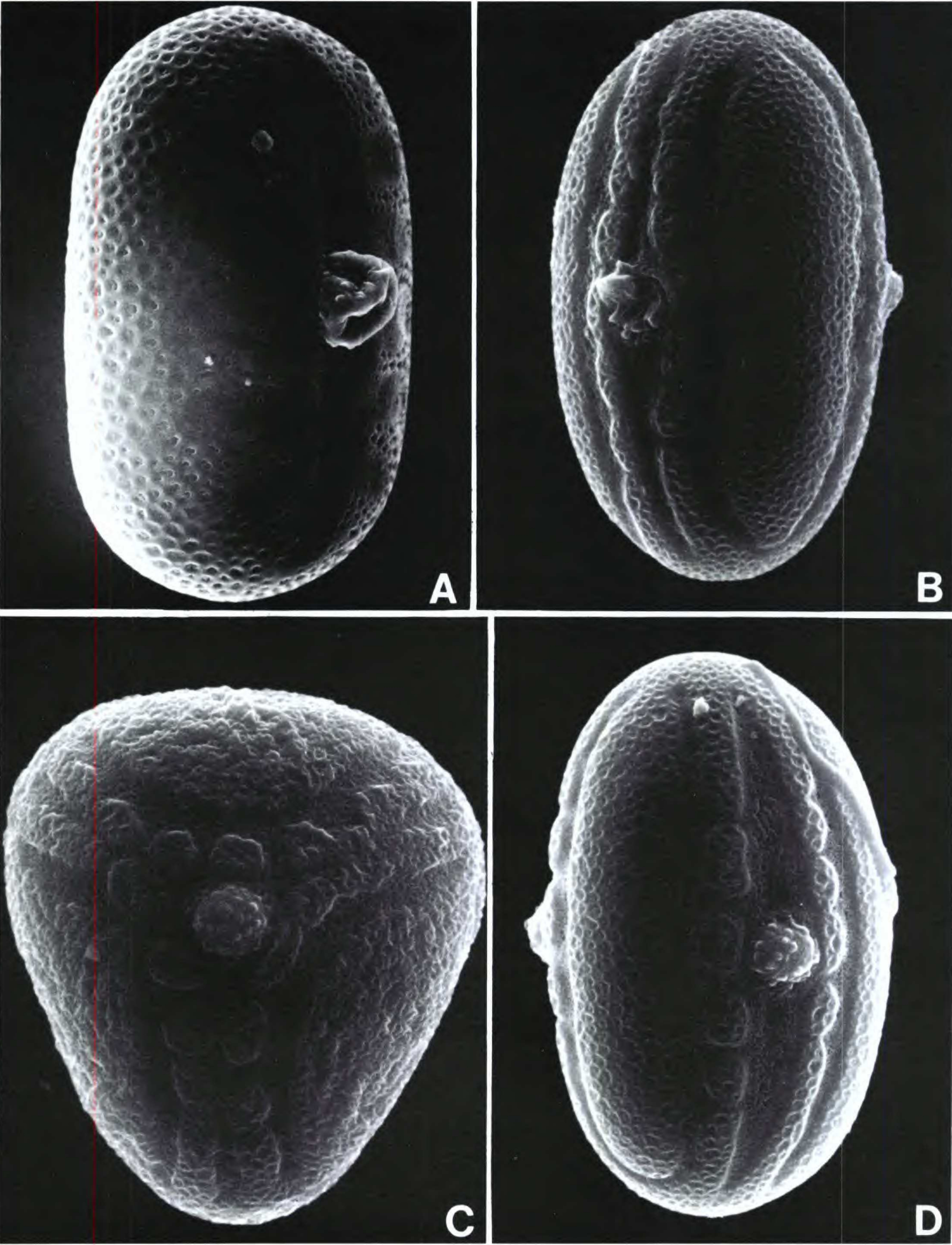


Figure 3. Scanning electron (SEM) photomicrographs of *Justicia* pollen. —A. *J. monachinoi*, equatorial view,  $\times 2,000$  (*Wurdack & Monachino 39978*). B, C. *J. huberi* (*Huber 12731*). —B. Equatorial view,  $\times 1,700$ . —C. Equatorial view,  $\times 2,000$ . —D. *J. parwana*, equatorial view,  $\times 1,800$  (*Maguire & Politi 28244*).



and the corollas are deep rose-colored, 40–45 mm long and glabrous.

**6. *Justicia panarensis* Wasshausen, sp. nov.**

TYPE: Venezuela. Bolívar: Dist. Cedeño, vicinity of Panare village of Coroza, 6 km from Maniapure toward Caicara, 6°55'N, 66°30'W, 90 m, 11 Oct. 1985, *Boom & Grillo 6315* (holotype, US). Figure 2E–H.

Suffrutex debilis, caulibus subquadrangularibus, puberulis. Foliorum lamina oblongo-ovata, acuta vel brevicauminata, basi angustata, firma, supra parce puberula, subtus puberula, costa sicut venis lateralibus puberula et pilosa; petioli dense puberuli; spicae solitariae vel plures axillares et terminales, pedunculis et rachidibus subquadrangularibus, puberulis; bracteae viridae, ovatae, glabrae vel parce puberulae, parce ciliatae; bracteolae lanceolatae, glabrae vel parce puberulae, ciliatae; calycis segmenta lanceolata, ciliolata, parce puberula; corolla scarlatina, minute pubescens, tubo anguste infundibuliformi, labio superiore erecto, oblongo vel anguste ovato, bilobato, labio inferiore trilobato, lobis oblongis, rotundatis; stamina exserta; lobi antherarum superpositi.

Weak shrub 0.5 m tall; stem erect, subquadrangular, puberulous, the trichomes retrorsely curved, subappressed. Leaves on petioles 8–12 mm long, these densely puberulous with curved trichomes, the blades oblong-ovate, 5–7 cm long and 2.5–3 cm wide, acute to short-acuminate, narrowed at base, rather firm, entire or undulate, the upper surface sparingly puberulous, the lower surface moderately puberulous, occasionally interspersed with a few pilose trichomes, the costa and lateral veins (5–6 pairs) puberulous and pilose, the cystoliths often inconspicuous and scattered. Spikes one to several, axillary and terminal, 5–6 cm long and 2–2.5 cm broad, obtuse or rounded at tip, the peduncles 0.5 cm long, the rachis puberulous, the trichomes erect, white, about 0.3 mm long; bracts green, ovate, 19 mm long, 9.5–10 mm wide, acute, obtuse at base, thin, glabrous or sparingly puberulous, sparingly ciliate, the veins coarsely reticulate, these and the costa rather prominent; bracteoles lanceolate, 8 mm long, 2.5–3 mm wide, glabrous or sparingly and minutely puberulous, the margins ciliate, the costa prominent, the lateral veins delicately and coarsely reticulate; calyx 6 mm long, deeply 5-segmented, the segments lanceolate, 5.5 mm long, 1.2 mm wide, ciliate, minutely and sparingly puberulous, the costa prominent; corolla red, 40 mm long, finely pubescent, the trichomes to 0.2 mm long, the tube 3 mm broad at base, narrowed to 2.5 mm at 3 mm above base, thence gradually enlarged to 5 mm at mouth, the lips subequal, 18 mm long, the upper lip oblong to narrowly ovate, 7.5 mm wide near the base, 1.5 mm wide near the tip, bilobed, the lobes

0.75 mm long, rounded, the lower lip  $\pm$  spreading, 3-lobed, the lobes oblong, 14 mm long, 4.5 mm wide, rounded at tip, delicately veined; stamens exerted 8 mm beyond the mouth of the corolla tube, the filaments white, flat, glabrous, the anthers 3 mm long, the thecae 1.5 mm long, superposed, somewhat obliquely attached to the connective, this about 0.5 mm wide, the upper thecae muticous, the lower terminating in a short blunt spur 0.25 mm long; pollen 2-porate, prolate to perprolate,  $60 \times 30 \mu\text{m}$ , the pores circular, the membrane reticulate, trema area studded with 2 rows of 7–10,  $\pm$  circular insulae (Fig. 8A, B); ovary glabrous; style 2.5 cm long, minutely puberulous at base. Capsule wanting.

*Distribution.* In semideciduous forest on granitic slopes and savanna, 90–400 m. Known only from the type locality.

*Justicia panarensis* superficially resembles *J. leucerythra* Leonard from Colombia. However, in *J. leucerythra* the bracts are firm, 8 mm wide, the corolla is pink or occasionally red, to 33 mm long, with the subequal lips 11 mm long, and the leaf blades are larger, 20 cm long and 6 cm wide. In *J. panarensis* the bracts are thin, 9.5–10 mm wide, the corolla is red, 40 mm long, with the subequal lips 18 mm long, and the leaf blades are much smaller, 5–7 cm long and 2.5–3 cm wide.

**7. *Justicia paruana* Wasshausen, sp. nov. TYPE:**

Venezuela. Territorio Federal Amazonas: Serranía Parú, Río Parú, Caño Asisa, Río Ventuari, 1,800 m, 1 Feb. 1951, *Cowan & Wurdack 31116* (holotype, US; isotype, NY). Figure 4A–E.

Suffrutex debilis, caulibus aliquantum ramosis, subquadrangularibus, minute puberulis. Foliorum lamina oblonga vel lanceolata, acuminata, basi angustata, firma reticulato-venosa, utrinque glabra vel in costa et venis lateralibus parce puberula; petioli puberuli; spicae terminales et axillares, pedunculis subquadrangularibus, puberulis; bracteae vinaceae, ellipticae, glanduloso-puberulae et ciliatae; bracteolae vinaceae, oblanceolatae; calycis segmenta linearia, puberula, ciliolata; corolla rosea, puberula, tubo anguste infundibuliformi, labio superiore erecto, ovato, bilobato, labio inferiore trilobato, lobis oblongis, rotundatis; stamina exserta; lobi antherarum superpositi.

Weak shrub 1.5–3 m tall, somewhat branched; stems erect, subquadrangular, minutely puberulous, the trichomes antrorsely curved, subappressed. Leaves on petioles 9–15 mm long, these puberulous with appressed-ascending trichomes, the blades oblong to lanceolate, 6.5–8 cm long and 1.8–2.3 cm wide, acuminate, narrowed at base, firm, net-veined, entire or undulate, the margins revolute, the upper surface subnitid, glabrous or the costa bearing a few



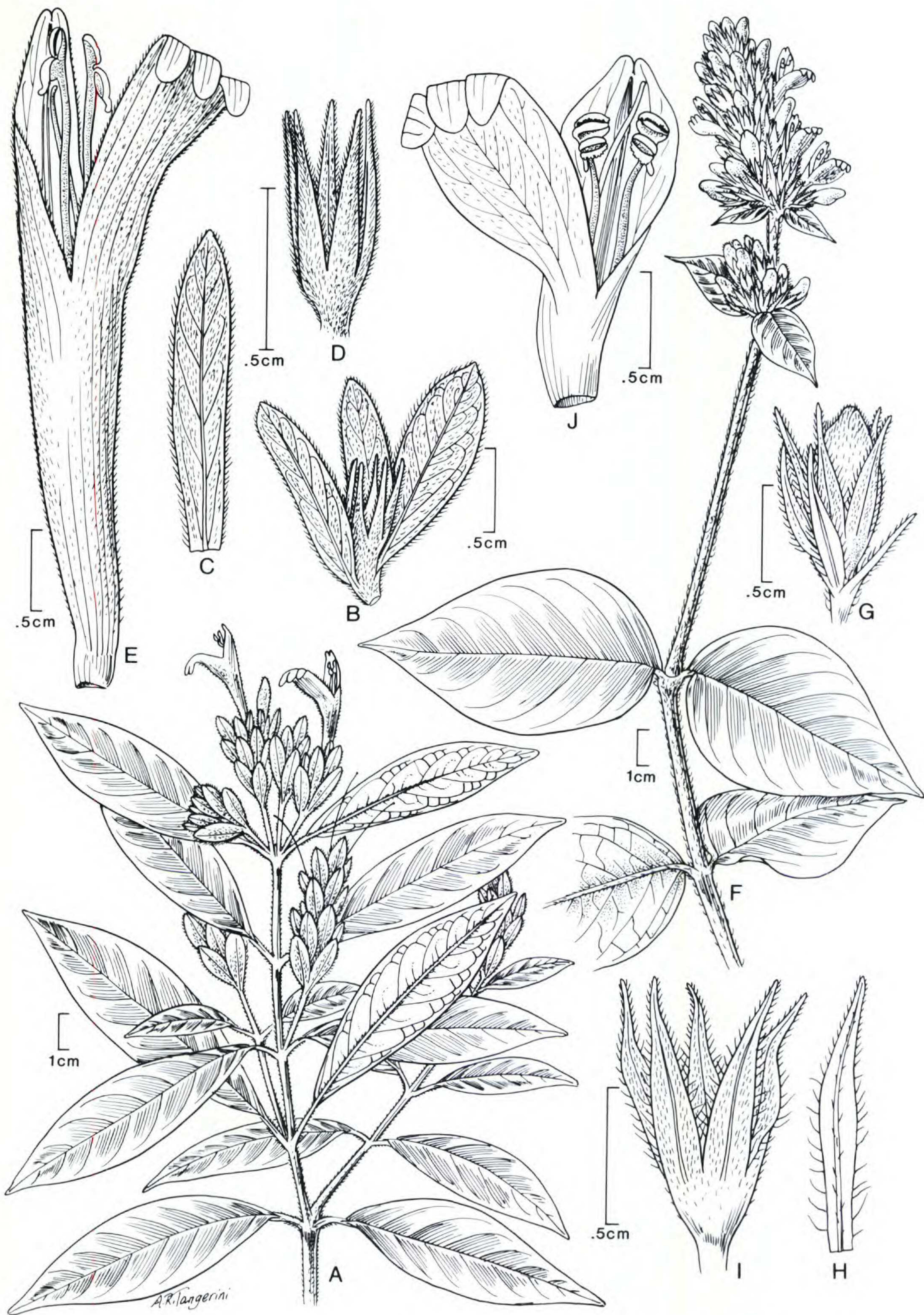


Figure 4. A-E. *Justicia paruana* Wasshausen (Cowan & Wurdack 31116). —A. Habit. —B. Bract, bracteoles, and calyx. —C. Bracteole. —D. Calyx segments. —E. Corolla and stamens. F-J. *Justicia uvida* Wasshausen (Steyermark & Aristeguieta 35). —F. Habit. —G. Bract, bracteole, and immature corolla. —H. Bracteole. —I. Calyx. —J. Corolla and stamens.



small trichomes, the cystoliths minute, inconspicuous, the lower surface glabrous except the costa and lateral veins (5–6 pairs), these minutely and sparingly puberulous, on both surfaces the costa and lateral veins are prominent and conspicuously raised. Flowers borne both in axillary and terminal spikes 3.5–5 cm long and 1–1.5 cm broad, obtuse or truncate at tip, the peduncles 10–15 mm long, subquadrangular, puberulous, the trichomes erect; bracts wine-colored, elliptic, 14 mm long, 5–5.2 mm wide, acute to short acuminate, narrowed at base, puberulous with both glandular and eglandular trichomes, the margins ciliate; bracteoles wine-colored, oblanceolate, 12 mm long, 2.5 mm wide, puberulous, the margins ciliate, the trichomes occasionally gland-tipped; calyx deeply 5-segmented, the segments linear, 4.5 mm long, 0.5 mm wide, puberulous, ciliate, the trichomes erect, occasionally gland-tipped; corolla rose-colored, 35–40 mm long, sparingly and inconspicuously puberulous, the tube 2 mm broad at base, narrowed to 1.5 mm at 3 mm above base thence gradually enlarged to 6 mm at mouth, the lips subequal, 17 mm long, the upper lip ovate, 7.5 mm wide near the base, narrowed toward tip, bilobed, the lobes 0.5 mm long, rounded, the lower lip  $\pm$  spreading 3-lobed, the lobes oblong, 2.5 mm long, the lateral lobes 2 mm wide, the middle lobe 1.5 mm wide, all rounded at tip, delicately veined; stamens exserted 15 mm beyond the mouth of the corolla tube, the filaments flattened, glabrous, the anthers 4 mm long, the thecae 2.5 mm long, superposed, somewhat obliquely attached to the connective which itself is about 0.5 mm wide, both thecae terminating at the base in a short, white spur 0.25 mm long; pollen 3-porate, prolate to perprolate,  $46 \times 24 \mu\text{m}$ , the pores circular, the membrane reticulate, trema area studded with 2 rows of 4,  $\pm$  circular insulae (Fig. 3D); ovary glabrous; style 3.2 cm long, glabrous; stigma minute, bilobed. Capsule clavate, puberulous, 12 mm long, 4 mm broad, 3 mm thick, the solid stipe 5 mm long and 2.5 mm broad, gland-dotted; seeds not seen.

*Distribution.* Occasional, in talus forest and woodland along streams at elevations between 1,600 and 1,800 m, in Territorio Federal Amazonas, Venezuela.

*Paratypes.* VENEZUELA. TERRITORIO FEDERAL AMAZONAS: Cerro Siapo (Paraque), N branch of Caño Profundo, 1,600 m, *Maguire & Politi* 28227 (US); upper Caño Negro, 1,600 m, *Maguire & Politi* 28244 (NY, US).

*Justicia parwana* is closely affiliated with another Venezuelan species, *J. huberi* Wasshausen from Estado Bolívar. Its relationship to *J. huberi* is described under that taxon.

**8. *Justicia uvida*** Wasshausen, sp. nov. TYPE: Venezuela. Bolívar: vicinity of km 128 S of El Dorado, NE of Luepa, 800–1,200 m, 6–11 Mar. 1962, *Steyermark & Aristeguieta* 35 (holotype, US; isotype, VEN). Figure 4F–J.

Herba, caulibus ramosis, plus minusve patulis, quadrangularibus, glabris vel parce puberulis; folii lamina ovata, breviacuminata, basi rotundata, subchartacea, utrinque glabra vel subtus secus costam puberula; petioli breves; spicae terminales vel subterminales, densiflorae, contractae, pedunculis et rachidibus puberulis; bractaeae et bracteolae lanceolatae, glabrae et ciliatae; calycis segmenta lanceolata, ciliata; corolla roseo-lavandulacea, infra glabra, sursum pilosa, labio superiore erecto, obovato-elliptico, apice bilobato, labio inferiore trilobato, erecto vel reclinato, obovato vel ovato, lobis obovatis, rotundatis; stamina exserta; lobi antherarum leviter superpositi.

Sprawling, subherbaceous, to 2 m tall; stems elongated, obscurely quadrangular, shallowly sulcate, at least above, glabrous or sparingly puberulous, the trichomes curved and subappressed, about 0.5 mm long, disposed  $\pm$  in 2 rows, the internodes of the stem 3.5–10.5 cm long. Leaves sessile or very shortly petiolate; if petiolate then petioles 1–2 mm long, densely puberulous, the trichomes sordid, the blades ovate, 6.5–8 cm long and 3.5–4.7 cm wide, with the uppermost pair of leaves conspicuously reduced (2.5–3 cm long, 1.3–1.4 cm wide) and subtending the spikes, short-acuminate, obtuse or rounded at base, firm subchartaceous, entire or undulate, deep green and sulcate-nerved above, dull green with raised nerves (about 6 pairs) below, both surfaces glabrous or the costa beneath minutely and inconspicuously puberulous, the cystoliths of both surfaces inconspicuous under a lens. Flowers in short, dense spikes forming a compound spicate inflorescence 3–7 cm long and 2.5–3 cm wide including the corollas, the flowers fascicled, the rachises and peduncles rather densely and bifariously puberulous, the trichomes erect or ascending, about 0.2 mm long, the peduncles 10–13.5 cm long, the nodes of the spike bearing a pair of small leaves (their blades 13–22 mm long and 4–9 mm wide); bracts subtending the flowers lanceolate, 5.5–6 mm long, 1 mm wide, carinate, mucronulate at apex, firm, glabrous, the margin ciliate; bracteoles similar but slightly larger; calyx 8–9 mm long, deeply segmented, the five segments lanceolate, 6.25–8.25 mm long, 1.75 mm wide slightly above the middle, acuminate, the tip curved, the costa prominent, bearing dorsally a few glandular and eglandular trichomes, the margins ciliate, the trichomes whitish, erect or ascending, 0.5 mm long; corolla rose-lavender, 16 mm long, glabrous toward base, finely pilosulous toward tip, the trichomes spreading, to 0.4 mm long, the tube 6 mm long, 3 mm broad at base, gradually enlarged



to 4 mm at mouth, the upper lip obovate to elliptic,  $\pm$  erect, about 11 mm long, 6 mm wide at middle, plicate, dorsally pilosulous, the trichomes glandular or eglandular interspersed, bilobed at tip, the lobes rounded, 0.5 mm long and 1 mm wide at base, the lower lip striped white and lavender, obovate to ovate, erect or reclinate, 12 mm long, 9 mm wide, 3-lobed, the lobes obovate, rounded, 3.5 mm long, the middle lobe 3.5 mm wide, the lateral lobes 2.5 mm wide; stamens exerted 8 mm beyond the mouth of the corolla, the filaments flattened and glabrous, the anther thecae slightly superposed, the connective 1 mm broad, the upper thecae 1.5 mm long, 0.5 mm broad, white-puberulous on the margin, muticous and minutely spurred at base, the lower thecae 1 mm long and 0.5 mm broad, white-puberulous on margin, terminating in a thecal appendage about 1 mm long; pollen triporate, subprolate to perprolate,  $36 \times 20 \mu\text{m}$ , the pores circular, the membrane reticulate, trema area inconspicuously studded with 2 rows of  $\pm$  circular insulae (Fig. 6A); style about 14 mm long, minutely puberulous, the stigma minutely bilobed; ovary glabrous. Capsule clavate, 9 mm long, 3 mm wide, brownish, puberulous; seeds not seen.

*Distribution.* In gallery forest, along banks of rivulets and swale margins, Estado Bolívar, Venezuela, at 460–1,400 m.

*Paratypes.* VENEZUELA. BOLÍVAR: Gran Sabana, N of Uriman,  $5^{\circ}29'N$ ,  $62^{\circ}36'W$ , 460 m, *Fernández 2548* (MYF, US); Depto. Piar, Río Karwai, around Irana-Waimáh, 20 km from Kavanayén, 1,200 m, *Ruiz-Teran & López-Palacios 11311* (MERF, US); Río Taratá, km 147–148 S of El Dorado, 1,220 m, *Gentry, Morillo & B. de Morillo 10554* (MO); ca. km 148 S of El Dorado, headwaters of the Río Apongua, along Arauta-parú, 1,350–1,400 m, *Steyermark & G. C. K & E. Dunster-ville 104157* (US, VEN).

*Justicia uvida* superficially resembles *J. maguirei* Wasshausen from Guyana. However, in *J. maguirei* the bracts and bracteoles are narrowly triangular, 2–3 mm long, the calyx segments 5.5 mm long, straight at tip and the corolla, probably purple or red, is 18–22 mm long with the lobes of the lower lip ovate, 3 mm long, the middle lobe 5 mm wide and the lateral lobes 3 mm wide. In contrast, *J. uvida* has bracts and bracteoles lanceolate, 5.5–10 mm long, the calyx segments are 6.25–8.25 mm long, the tips curved and the corolla is rose-lavender, 16 mm long with the lobes of the lower lip obovate, 3.5 mm long, the middle lobe 3.5 mm wide and the lateral lobes 2.5 mm wide.

**9. *Justicia delascioi*** Wasshausen, sp. nov. TYPE: Venezuela. Territorio Federal Amazonas: Dep-

to. Atabapo, Salto Yureba, Caño Yureba, Bajo Ventuari,  $4^{\circ}3'N$ ,  $66^{\circ}1'W$ , 120–150 m, 24 Oct.–4 Nov. 1981, *Delascio & Guánchez 10896* (holotype, US). Figure 5A–C.

Frutex vel suffrutex, caulibus subquadrangularibus, glabris. Foliorum lamina late lanceolata vel ovata, acuminata, basi angustata, firma, utrinque glabra vel parce puberula, costa et venis lateralibus puberulis; cymae axillares et terminales, pedunculis et pedicellis glabris; bracteae pedunculis subtentes foliaceae, ovatae, glabrae; bracteae floribus subtentes oblanceolatae, ciliolatae, glabrae; calycis segmenta oblonga vel elliptica, glabra; corolla lilacina, glabra vel minute glanduloso-pubescent, labio superiore erecto, ovato, bilobato, labio inferiore trilobato, lobis ellipticis, rotundatis; stamina exserta; lobis antherarum superpositis.

Shrub or subshrub, erect, 0.5 m tall; stem subquadrangular, glabrous. Leaves on petioles 1.5 cm long, these puberulous in two rows on the edge of channels, the trichomes retrorsely curved, the blades broadly lanceolate to ovate, 6.5–8 cm long and 2–2.7 cm wide, acuminate, narrowed at base, rather firm, entire or undulate, both the upper and lower surfaces glabrous or sparingly and inconspicuously puberulous, the costa and lateral veins (4 or 5 pairs) bearing a few appressed-ascending trichomes, inconspicuous on both surfaces, the cystoliths conspicuous under a lens and scattered on the upper surface, less conspicuous beneath. Flowers (2 to 3) borne in short axillary and terminal cymes, these 1.5–2 cm long, the peduncles 3.5–6 cm long, the secondary peduncles 6–9 mm long, both primary and secondary peduncles glabrous, subquadrangular, the angles rounded; bracts subtending the secondary peduncles leaflike, ovate, 8–15 cm long, 2–6 mm wide, acuminate at tip, glabrous without, minutely puberulous within, the petioles 2–4 mm long; bracts subtending the flowers oblanceolate, 10 mm long, 2 mm wide, ciliolate, glabrous, with scattered, brownish cystoliths visible under magnification; calyx deeply 5-segmented, the segments oblong to elliptic, 14 mm long, 4 mm wide near the middle, acuminate at apex, narrowed toward the base, coriaceous, glabrous, drying yellowish; corolla lilac, about 25 mm long, glabrous or minutely and inconspicuously glandular pubescent, the tube 13 mm long, 3 mm broad at base, 7 mm broad at mouth, the upper lip erect, ovate, 12–13 mm long, 7 mm wide, bilobed at apex, the lobes rounded, 0.5 mm long and wide, cucullate, enclosing the stamens, the lower lip 15 mm long and 1 cm wide at base of the 3 lobes, these elliptic, 7–8 mm long, 5–6 mm wide, rounded; stamens exerted 11 mm beyond the mouth of the corolla tube, the anthers 5.5 mm long, the thecae superposed, vertically attached to a connective which itself is 0.5 mm long, both thecae pu-





Figure 5. A-C. *Justicia delascioi* Wasshausen (Delascio & Guánchez 10896). —A. Habit. —B. Calyx. —C. Corolla and stamens. D-F. *Justicia breteleri* Wasshausen (Breteler 4761). —D. Habit. —E. Bract and calyx. —F. Bracteole, calyx segments, corolla, and stamens.



bescent, the lower thecae terminating in an appendage 1.75 mm long; pollen 2-porate, prolate to perprolate,  $55 \times 28 \mu\text{m}$ , the pores circular, the equatorial outline of the pollen with a distinct indentation at the equator, the trema region microreticulate (Fig. 6B); ovary puberulous; style 2 cm long, glabrous; stigma minute, bilobed. Capsule wanting.

*Distribution.* Known only from the type locality.

*Justicia delascioi* superficially resembles *J. hochreutineri* Macbride from Venezuela. However, in *J. hochreutineri* the flowers are borne in sessile or short-pedunculate axillary spikes, the calyx segments are oblong-lanceolate, setaceous-cuspidate, scabrous pubescent and drying green, and the bracts subtending the flowers are lanceolate and exceeding the calyx. In contrast, in *J. delascioi* the flowers are borne in axillary and terminal 2–3-flowered cymes on peduncles 3.5–6 cm long, the calyx segments are oblong to elliptic, acuminate, glabrous, and drying yellowish, and the bracts subtending the flowers are oblanceolate and shorter than the calyx.

**10. *Justicia breteleri* Wasshausen, sp. nov.**

TYPE: Venezuela. Territorio Federal Amazonas: left bank of Sipapo River near confluence with Orinoco River,  $\pm 90$  m, 20 Nov. 1965, *Breteler* 4761 (holotype, US). Figure 5D–F.

Suffrutex, caulibus erectis, subquadrangularibus, glabris vel minute puberulis. Foliorum lamina oblonga vel elliptica, acuminata, basi obtusa, firma, supra glabra, subtus minute puberula costa et venis lateralibus subtus prominentibus; petioli puberuli; paniculae terminales, spicis parvis compactis compositae, pedunculis et rachidibus subquadrangularibus, puberulis; bracteae oblongae, ciliolatae; bracteolae oblongae vel oblanceolatae, ciliolatae; calycis segmenta oblonga, glabra et ciliata; corolla nitida aurantiaca, tubo luteo, sursum gradatim ampliata, subtiliter pubescenti, labio superiore erecto, oblongo vel anguste ovato, bilobato, labio inferiore trilobato, patulo, lobis oblongis, rotundatis; stamina exserta; lobis antherarum superpositis.

Partly climbing, weak-stemmed shrub 2–4 m tall; stem erect, subquadrangular, glabrous or minutely and inconspicuously puberulous. Leaves opposite or whorled, on petioles 1–1.5 cm long, these minutely puberulous especially in two rows on the edge of channels, the blades oblong to elliptic, 11–15 cm long and 4–5.5 cm wide, acuminate, obtuse at base, rather firm, entire, dark green and glabrous above, dull paler green and minutely puberulous below, especially the costa and lateral veins (7–9 pairs), these inconspicuous above, raised and prominent beneath, the trichomes erect, the cystoliths inconspicuous under a lens above, scattered and con-

spicuous under a lens below, the margins revolute; inflorescence a terminal panicle composed of several short, compact spikes 2–2.5 cm long (excluding corollas), the peduncles 1–3 cm long, subquadrangular, puberulous, the internodes of the inflorescence 6 mm long, somewhat flattened, 2 mm wide, puberulous; bracts oblong, 13–15 mm long, 2.25–3 mm wide, ciliolate, glabrous or minutely and inconspicuously puberulous; bracteoles oblong to oblanceolate, 10 mm long, 1.4 mm wide, ciliolate, glabrous or minutely and inconspicuously puberulous; calyx deeply 5-segmented, the segments oblong, 8–9 mm long, 1.75 mm wide near the middle, acute to acuminate at apex, slightly narrowed toward the base, glabrous, the margins conspicuously ciliate; corolla glossy orange, yellow at the base, about 50 mm long, the tube finely pubescent, 32 mm long, 2.5 mm broad at base, narrowed to 1.5 mm at 5 mm above base, thence gradually enlarged to 5.5 mm at mouth, the lips subequal, 17–18 mm long, the upper lip oblong to narrowly ovate, finely pubescent, 8 mm wide near the base, 1 mm wide near the tip, bilobed, the lobes 0.4 mm long, rounded, the lower lip somewhat spreading, 3-lobed, the lobes oblong, 4 mm long, 1.5 mm wide, rounded at tips, densely pilose, the trichomes erect or spreading, 1–1.3 mm long; stamens exserted 16 mm beyond the mouth of the corolla tube, the filaments flat, glabrous, the anthers 4.5–5 mm long, the thecae 2.5 mm long, superposed, somewhat obliquely attached to the connective, this 0.5 mm wide, the upper thecae muticous, the lower terminating in a short blunt spur 0.5 mm long; pollen grains 2-porate, bilateral,  $60 \times 25 \mu\text{m}$ , the pores circular, the trema area microreticulate, traversed by 4 rows of 6–7 small smooth insulae (Fig. 6C, D); style 4.7 cm long, glabrous. Capsule clavate (not seen at maturity).

*Distribution.* Rare and infrequent at edge of river and along roadsides in the Departamento Atures, Territorio Federal Amazonas, Venezuela, at elevations between 80 and 200 m.

*Paratypes.* VENEZUELA. TERRITORIO FEDERAL AMAZONAS: Depto. Atures, 2 km below Caserío San Pedro de Cataniapo, 50 km SE of Puerto Ayacucho,  $5^{\circ}38'N$ ,  $67^{\circ}12'W$ , 100 m, *Guánchez* 179 (US); vicinity of “Las Pavas,” 25 km SE of Puerto Ayacucho on the road towards El Gavilán,  $5^{\circ}35'N$ ,  $67^{\circ}27'33''W$ , 80 m, *Cuello* 325 (US); mountainous region of la Coromoto, sector “El Tobogán,” 37 km S of Puerto Ayacucho,  $5^{\circ}24'N$ ,  $67^{\circ}35'W$ , 80–200 m, *Cuello* 352 (US).

*Justicia breteleri* is not closely allied to the other known species of neotropical *Justicia*. It is perhaps nearest in relationship to *J. sanchezoides* Leonard from the Comisaría Putumayo, Colombia, and the



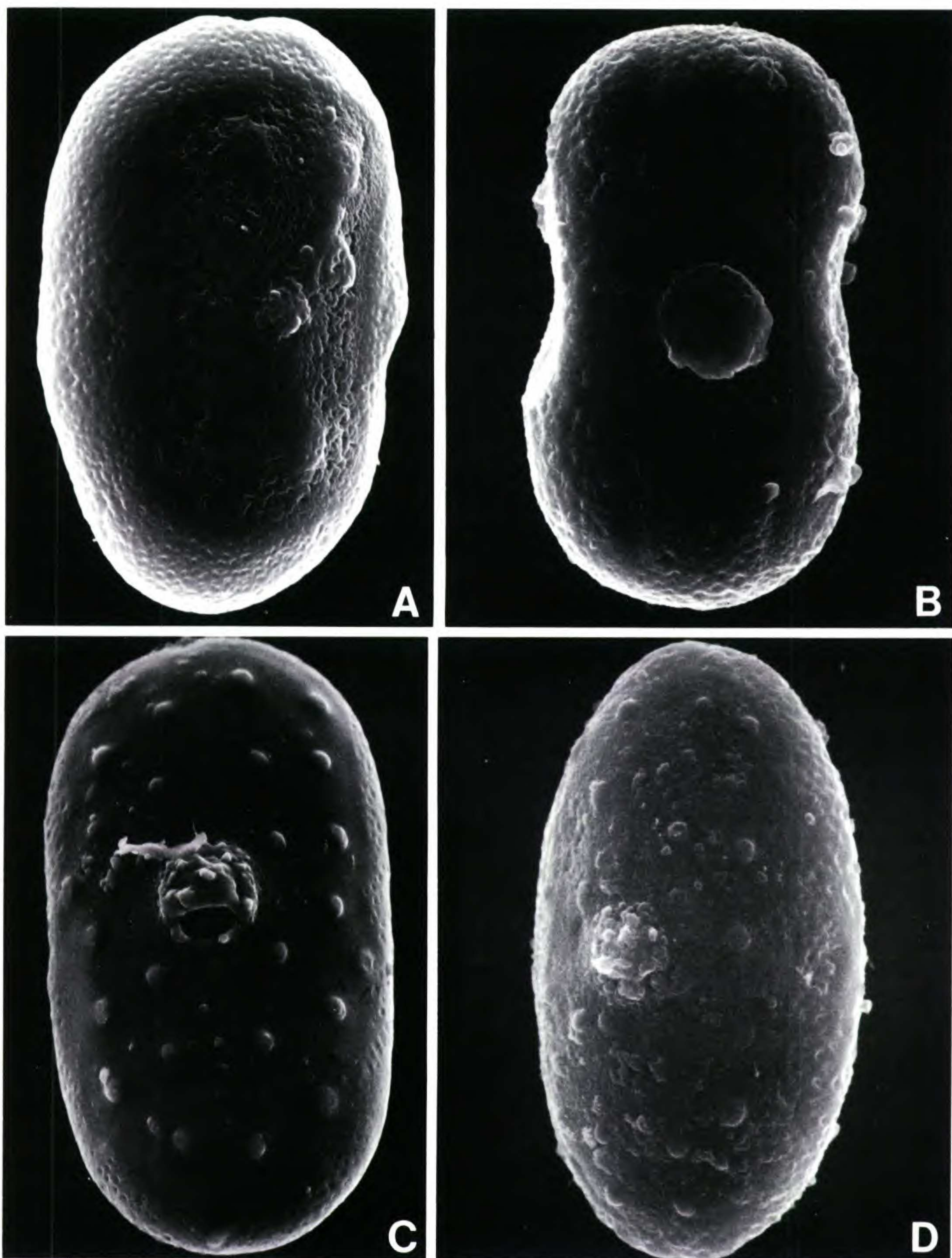


Figure 6. Scanning electron (SEM) photomicrographs of *Justicia* pollen. —A. *J. uvida*, equatorial view,  $\times 2,500$  (Steyermarck & Aristeguieta 35). —B. *J. delascioi*, equatorial view,  $\times 1,600$  (Delascio & Guánchez 10896). C, D. *J. breteleri*. —C. Equatorial view,  $\times 1,600$  (Breteler 4761). —D. Equatorial view,  $\times 1,800$  (Cuello 325).





Figure 7. A-E. *Justicia parimensis* Wasshausen (Huber & Colchester 8404). —A. Habit. —B. Bracts and calyx. —C. Corolla and stamens. —D. Bracts, calyx segments, cupula, glands, and immature capsule. —E. Capsule and retinaculum.



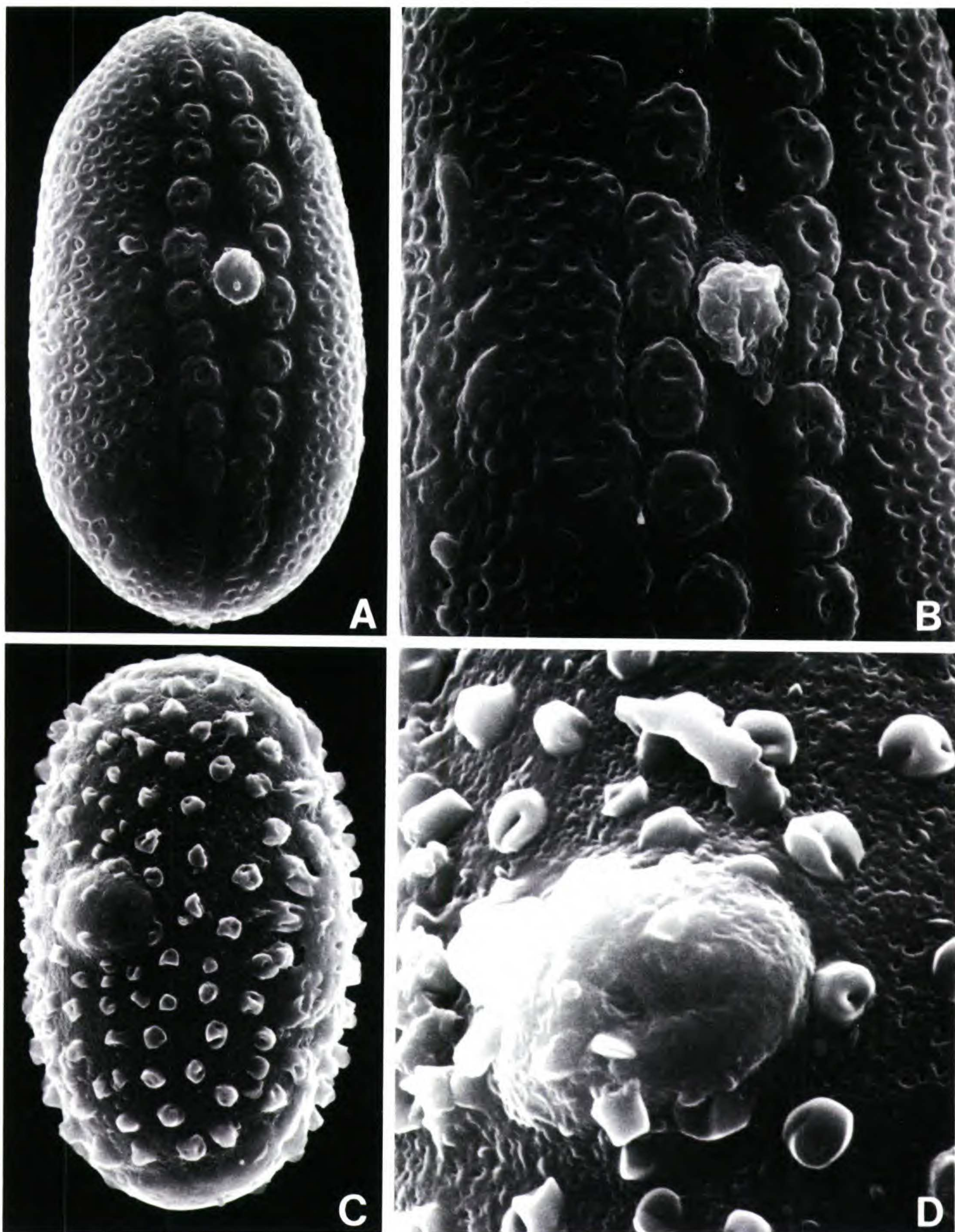


Figure 8. Scanning electron (SEM) photomicrographs of *Justicia* pollen. A, B. *J. panarensis* (Boom & Grillo 6315). —A. Equatorial view,  $\times 1,600$ . —B. Portion of surface,  $\times 3,000$ . C, D. *J. parimensis* (Huber & Colchester 8404). —C. Equatorial view,  $\times 1,600$ . —D. Portion of surface,  $\times 5,000$ .



Provincia Napo, Ecuador; however, this species is unique in that the inflorescence is a terminal panicle composed of several unilateral spikes 5–12 cm long (excluding the corollas), the corollas are pale purple or bright rose, 65 mm long, with the subequal lips 37 mm long, and the subequal bracts and bracteoles are lanceolate, 18 mm long, moderately hirsute with the bracteoles slightly longer than the bracts. In contrast, in *J. breteleri* the inflorescence is composed of short, terminal, compact spikes 2–2.5 cm long (excluding the corollas), the corollas are glossy orange, yellow at the base, 50 mm long, with the subequal lips 17–18 mm long, and the bracts and bracteoles are unequal, oblong to oblanceolate, glabrous or inconspicuously puberulous with the bracts 13–15 mm long and the bracteoles 10 mm long, respectively.

**11. *Justicia parimensis*** Wasshausen, sp. nov.  
TYPE: Venezuela. Territorio Federal Amazonas: Depto. Atabapo, Sierra Parima, NE sector, along the Río Matacuni, approx. 20 km NNW of Shimada–Wochi, 3°59'N, 64°41'W, 1,000–1,500 m, 10 Nov. 1983, *Huber & Colchester 8404* (holotype, US). Figure 7A–E.

Suffrutex, caulibus subquadrangularibus, sursum puberulis. Foliorum lamina elliptica vel ovata, acuminata, basi angustata et in petiolum decurrens, firma, utrinque glabra vel parce pilosa; petioli breves; spicae fasciculatae, in aggregis terminalibus paniculam formans, floribus secundis; bractae et bracteolae triangulares, glabrae et ciliatae; calycis segmenta lanceolata, apiculata, puberula; corolla rosea-lilacina, minute puberula, tubo anguste infundibuliformi, labio superiore erecto, ovato, minute bilobato, labio inferiore oblongo, trilobato, lobis rotundatis; stamina exserta; lobi antherarum superpositi; capsulae clavatae, puberulae, acutae, unumquaque valve bifida ad apicem.

Shrub or subshrub, erect, 1.5 m tall; stem subquadrangular, glabrous below, becoming puberulous above, the trichomes retrorsely curved, subappressed, arranged  $\pm$  in two rows. Leaves on short petioles 1–3 cm long, these glabrous or minutely puberulous especially in two rows on the edge of channels, the blades elliptic to ovate, 20–24 cm long, 6.4–8.8 cm wide, acuminate and curved at apex, narrowed at base and decurrent on the petiole, firm, entire, the upper surface drying dark green, glabrous or minutely and inconspicuously pilose, the costa and lateral veins (about 11 pairs) prominent but less so than those of the lower surface, the cystoliths minute and scattered on both surfaces, visible only under a lens, the lower surface drying a lighter green, glabrous or minutely and inconspicuously pilose especially along the venations; inflorescence terminal, the flowers secund in simple spikes, these fascicled, the peduncles 9–12 cm long,

the spikes forming in aggregate a loose terminal panicle 15–20 cm long and 5–8 cm wide (without the corollas), the branches of the inflorescence slender,  $\pm$  angular, puberulous, the trichomes short, erect, sometimes multicellular intermixed with some gland-tipped trichomes; bracts subtending the flowers triangular, barely 2 mm long and 1 mm wide at base, strongly costate, glabrous and ciliolate; bracteoles 1.5 mm long and 0.5 mm wide, in other respects similar to the bracts; calyx 10–13 mm long, light green, the segments narrowly lanceolate, 9–11 mm long, about 1 mm wide at base, minutely apiculate at apex, 3-nerved, puberulous, the trichomes erect, glandular and eglandular; corolla rose-lilac, minutely and inconspicuously puberulous, some of the trichomes gland-tipped, about 45 mm long, the tube 3 mm wide at base, 8 mm wide at the mouth, the upper lip erect, ovate, 20 mm long, 11 mm wide at base, bilobed at the tip, the lobes rotundate, 0.5 mm long and 0.75 mm wide, lower lip somewhat spreading, oblong, 24 mm long and 5 mm wide, trilobate, the lobes rotundate, 2.5 mm long, the middle lobe 2.5 mm wide, the lateral lobes 1 mm wide; stamens exserted, white, curved vertically and exceeding the upper corolla lip, the anther thecae oblique, superposed, the connective 1 mm long and 0.5 mm wide; pollen 2-porate, prolate to perprolate,  $51 \times 27 \mu\text{m}$ , trema area not differentiated, the whole surface of grain microreticulate, studded with smooth obtuse-conical verrucae (Fig. 8C, D); capsule clavate, 12 mm long, 4 mm wide, 3.5 mm thick, acute with each valve bifid at apex, puberulous; seeds orbicular, flat, 3 mm wide and long, glabrous.

*Distribution.* In rocky riverbed, between 1,000 and 1,500 m in Territorio Federal Amazonas, Venezuela. Known only from the type locality.

*Justicia parimensis* superficially resembles *J. calycina* (Nees) V. A. W. Graham from the Guianas and Venezuela. However, in *J. calycina* the flowers are borne secund, in spikelike racemes, the latter in a large, rather dense terminal panicle, the calyx segments are linear and tapering with a long point, 15–17 mm long, the corolla is brick red, glabrous and 50–60 mm long, and the valves of the capsule are glabrous and entire at apex. In contrast, in *J. parimensis* the flowers are borne in simple spikes, these fascicled, forming in aggregate a loose terminal panicle, the calyx segments are lanceolate, minutely apiculate at apex, 9–11 mm long, the corolla is rose-lilac, puberulous and 45 mm long, and the valves of the capsule are puberulous and bifid at apex.

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